

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-074127

(43)Date of publication of application : 17.03.1998

(51)Int.Cl.

G06F 3/033

G06F 3/033

(21)Application number : 08-229143

(71)Applicant : NEC HOME ELECTRON LTD

(22)Date of filing : 30.08.1996

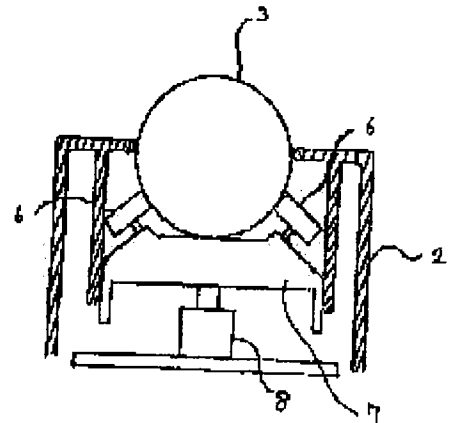
(72)Inventor : KUGIMIYA TAKASHI

(54) COMPUTER INPUT DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To secure a compact structure and the space reduction and also to improve the operability for a computer device by turning on an instruction definition switch via a means which detects the moved variable of a ball which moves a cursor displayed on the screen of a host system or the moved variables of (x) and (y) directions of a finger put on the ball.

SOLUTION: When a ball 3 is pushed into a case 2, a tray 7 moves together with the ball 3 and an instruction definition switch 8 is pushed. An encoder 6 causes no malfunction even when the ball 3 is pushed since the encoder 6 moves together with the ball 3 and the tray 7. Then an instruction is defined when the instruction definition information is sent to a host system via an interface cable or a signal transmission antenna. When the ball is released, the tray is reset at it's original position together with the ball 3 and the switch 8 is released. Thus, it's possible to define an instruction by a finger after a cursor is moved to a desired input position by the same finger and to improve the operability of a computer input device.



*** NOTICES ***

JP0 and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]Especially this invention relates to a pointing device about a computer input unit.

[0002]

[Description of the Prior Art]Conventionally, although a mouse is used, this kind of computer input unit, A trackball with the advantage which does not need the place of a flat surface required to operate it like a mouse in the use in a narrow place, and the use built in a host system for operating a mouse, Absolute positions, such as a finger, are detected and the touchpad which can output the movement magnitude of an X axial direction and Y shaft orientations is used.

[0003]For example, to JP,3-266018,A, the art of the trackball which can perform operation of a ball and a switch single hand is indicated. Drawing 5 is a perspective view of the conventional computer input unit shown in JP,3-266018,A. Drawing 6 is a sectional view of the conventional computer input unit shown in drawing 5. The directions settlement switch 18 for becoming final and conclusive the directions to the ball 17 installed from drawing 5 so that it could be rotated in all the directions by the trackball 16, and a host system, It is constituted from drawing 6 in the trackball 16 by the rotation of the ball 17, and the encoder 19 which detects a hand of cut. If the ball 17 projected in the upper part of the trackball 16 is rotated with a finger, the encoder 19 will detect a rotation and a hand of cut, and will change into a pulse signal, and it will be transmitted as information for moving the cursor on a screen to a host system. The directions settlement switch 18 uses the information on the part directed by the cursor on a screen for inputting into a host system.

[0004]Although both hands were required for operation of the conventional trackball, When this directions settlement switch 18 adjoins the ball 17 on the surface of the trackball 16, It came to be able to perform decision of directions by moving the ball 17 by an index finger by moving the cursor on the screen of a host system to the target position, and pushing the directions settlement switch 18 with the thumb. That is, operation of the ball 17 and operation of the directions settlement switch 18 became possible single hand, and operation equivalent to a mouse was attained.

[0005]

[Problem(s) to be Solved by the Invention]However, the following new problems will be produced in this conventional computer input unit.

[0006]It is necessary for the first problem to move the ball 17 with a certain finger, when a quick input is required, and to push the directions settlement switch 18 with another finger. Since a finger is once lifted and it reputs on another side when operating it with the same finger and becoming final and conclusive directions, the adjoining ball 17 and directions settlement switch 18 ** are moved, and it may be hard to carry out operation. The reason is because the ball 17 and the directions settlement switch 18 adjoin on the trackball 16.

[0007]In the host system with which a miniaturization is demanded, a place required for installation

may be unable to secure the second problem easily. The reason is because the area of the trackball 16 which appears in the host system surface becomes large, when the ball 17 and the directions settlement switch 18 adjoin on the trackball 16.

[0008]Therefore, the purpose of this invention raises operativity from becoming final and conclusive directions, without moving cursor with one finger and lifting the finger, and there is in providing the computer input unit which lessens a miniaturization and operation space of a device.

[0009]

[Means for Solving the Problem]A computer input unit of this invention unifies a switch for becoming final and conclusive a ball and directions to which cursor is moved, and after it moves cursor and moves to a position of hope, it is characterized by a trackball which carries out directions decision with the same finger, without lifting a finger.

[0010]Other computer input units of this invention unify a switch for becoming final and conclusive a touchpad and directions to which cursor is moved, and after they move cursor and move to a position of hope, they are characterized by a touchpad which carries out directions decision with the same finger, without lifting a finger.

[0011]

[Embodiment of the Invention]Hereafter, it explains, referring to drawings for the embodiment of the invention of this invention.

[0012]First, a first embodiment of this invention is described with reference to drawing 1 and drawing 2. Drawing 1 shows the perspective view of this invention, and, similarly drawing 2 shows an important section sectional view.

[0013]The computer input unit 1 of this embodiment is projected in part from the case 2 of the shape which is easier to grasp by one hand as an example of a coat than drawing 1, and the case 2, The interface cable or the antenna 5 for signal transmission as an example of a means which transmits decision of the ball 3 attached enabling free rotation, the switch 4, and directions, the X-axis of a ball, and the rotation of Y shaft orientations to a host system, From drawing 2, the encoder 6 and the ball 3 which detect the hand of cut and rotation of the ball 3 enter into the inside of the case 2 to inside to the case 2, It constitutes from the saucer 7 as an example of the returning structure, and the directions settlement switch 8 as an example of a means which becomes final and conclusive the directions to a host system when the ball 3 goes into inside to the case 2.

[0014]Next, operation of this computer input unit 1 is explained. The rotation and hand of cut of the ball 3 are detected by the encoder 6. The encoder 6 changes into a pulse signal the rotation and hand of cut which were detected using a photosensor, a magnetic sensor, etc. A pulse signal is transmitted to a host system via an interface cable or the antenna 5 for signal transmission. The directions settlement switch 8 is in the lower part of the saucer 7, the ball 3 is pushed, if it enters into the case 2, the saucer 7 will move with the ball 3 and the directions settlement switch 8 will be pushed. In order that the encoder 6 may move with the ball 3 and the saucer 7, even if the ball 3 is pushed, the encoder 6 does not malfunction. Directions are become final and conclusive by transmitting the information on the directions decision to a host system via an interface cable or the antenna 5 for signal transmission. Then, if the ball 3 is released, the saucer 7 will return to the original position with the ball 3, and the directions settlement switch 8 will be canceled. The switch 4 is used for the purpose of inputting information into a host system in addition to movement of cursor, and directions decision. Therefore, the switch 4 may not be formed or may be formed. [two or more] The inside of a host system may be equipped also besides putting into the case 2 and considering it as an independent input device.

[0015]Next, the operation method of this input device 1 is explained. The computer input unit 1 is grasped by hand, and the thumb is put on the ball 3. The ball 3 is rotated and it moves to the part which wants to point to the cursor on the screen of a host system. If movement is completed, the ball 3 will be pushed from a top with the thumb. Directions are become final and conclusive now. The switch 4 is operated by an index finger etc. When the inside of a host system is equipped, except

the thumb may be sufficient as the finger which operates the ball 3.

[0016]According to this embodiment, cursor operation and directions decision can be performed only with one finger.

[0017]Next, a second embodiment of this invention is described with reference to drawing 3 and drawing 4. Drawing 3 shows the plan of this invention and, similarly drawing 4 shows a sectional view.

[0018]According to the embodiment of the invention, from drawing 3 the computer input unit 9, As an example of a means which detects the case 10 as an example of a coat, the X-axis of the finger put on the top, and the movement magnitude of Y shaft orientations. The interface cable or the antenna 13 for signal transmission as an example of a means which transmits the X-axis of the ** touchpad 11, the switch 12, directions decision, and a finger and the movement magnitude of Y shaft orientations to a host system is formed. The inside of the case 10 from drawing 4 under the touchpad 11 and its touchpad 11, A means to detect the X-axis of a finger and the movement magnitude of Y shaft orientations consists of the saucer 14 as an example of the structure which enters and returns to inside to a coat, and the directions settlement switch 15 as an example of a means which becomes final and conclusive directions to a computer under the saucer.

[0019]Next, operation of this input device 9 is explained. As one example of the touchpad 11, if a sheet shaped capacitor is touched, it will use as a sensor which detects the touched position using the electric capacity of the portion changing. The electric capacity of the portion traced when the surface of the touchpad 11 was traced with the finger changes, and the degree detects the movement magnitude and the direction of a finger. There are some which detect the movement magnitude and the direction of a finger from change of the pressure which used change and the touch screen of the resistance using a resistance film as other examples of the touchpad 11. The movement magnitude and the direction which were detected are changed into a pulse signal. This pulse signal is transmitted to a host system via an interface cable or the antenna 13 for signal transmission as information for moving the cursor on a screen. If the directions settlement switch 15 is in the lower part of the saucer 14, the touchpad 11 is pushed and it enters into the case 10, the saucer 14 will move with the touchpad 11 and the directions settlement switch 15 will be pushed. Directions are become final and conclusive by transmitting the information to a host system via an interface cable or the antenna 13 for signal transmission. Then, if the touchpad 11 is released, the saucer 14 will return to the original position with the touchpad 11, and the directions settlement switch 15 will be canceled. The switch 12 is used for the purpose of inputting information into a host system in addition to movement of cursor, and directions decision. Therefore, the switch 12 may not be formed or may be formed. [two or more] The inside of a host system may be equipped also besides putting into the case 10 and considering it as an independent input device.

[0020]Next, the index finger explaining the operation method of this input device 9 is put on the touchpad 11. An index finger is moved on the touchpad 11 and it moves to the part which wants to point to the cursor on the screen of a host system. If movement is completed, the touchpad 11 will be pushed from a top in an index finger. Directions are become final and conclusive now. The switch 12 is operated with the thumb. When the inside of a host system is equipped, except an index finger may be sufficient as the finger which operates the touchpad 11.

[0021]According to this embodiment, cursor operation and directions decision can be performed only with one finger.

[0022]

[Effect of the Invention]As explained above, according to this invention, a directions settlement switch is turned on by pushing in a means to detect the X-axis of a finger and the movement magnitude of Y shaft orientations which were put on the ball to which the cursor displayed on the screen of a host system is moved, or the top. Therefore, after moving cursor and moving to the input position of hope, it comes to be able to perform directions decision with the same finger, and miniaturization of a device, reduction of a space required for operation, and improvement in

operativity can be aimed at.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Field of the Invention]Especially this invention relates to a pointing device about a computer input unit.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art]Conventionally, although a mouse is used, this kind of computer input unit, A trackball with the advantage which does not need the place of a flat surface required to operate it like a mouse in the use in a narrow place, and the use built in a host system for operating a mouse, Absolute positions, such as a finger, are detected and the touchpad which can output the movement magnitude of an X axial direction and Y shaft orientations is used.

[0003]For example, to JP,3-266018,A, the art of the trackball which can perform operation of a ball and a switch single hand is indicated. Drawing 5 is a perspective view of the conventional computer input unit shown in JP,3-266018,A. Drawing 6 is a sectional view of the conventional computer input unit shown in drawing 5. The directions settlement switch 18 for becoming final and conclusive the directions to the ball 17 installed from drawing 5 so that it could be rotated in all the directions by the trackball 16, and a host system, It is constituted from drawing 6 in the trackball 16 by the rotation of the ball 17, and the encoder 19 which detects a hand of cut. If the ball 17 projected in the upper part of the trackball 16 is rotated with a finger, the encoder 19 will detect a rotation and a hand of cut, and will change into a pulse signal, and it will be transmitted as information for moving the cursor on a screen to a host system. The directions settlement switch 18 uses the information on the part directed by the cursor on a screen for inputting into a host system.

[0004]Although both hands were required for operation of the conventional trackball, When this directions settlement switch 18 adjoins the ball 17 on the surface of the trackball 16, It came to be able to perform decision of directions by moving the ball 17 by an index finger by moving the cursor on the screen of a host system to the target position, and pushing the directions settlement switch 18 with the thumb. That is, operation of the ball 17 and operation of the directions settlement switch 18 became possible single hand, and operation equivalent to a mouse was attained.

[Translation done.]

*** NOTICES ***

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention]As explained above, in this invention, a means to detect the X-axis of a finger and the movement magnitude of Y shaft orientations which were put on the ball to which the cursor displayed on the screen of a host system is moved, or the top is pushed in. Therefore, a directions settlement switch is turned on.

Therefore, after moving cursor and moving to the input position of hope, it comes to be able to perform directions decision with the same finger, and miniaturization of a device, reduction of a space required for operation, and improvement in operativity can be aimed at.

[Translation done.]

*** NOTICES ***

JP0 and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, the following new problems will be produced in this conventional computer input unit.

[0006]It is necessary for the first problem to move the ball 17 with a certain finger, when a quick input is required, and to push the directions settlement switch 18 with another finger. Since a finger is once lifted and it reputs on another side when operating it with the same finger and becoming final and conclusive directions, the adjoining ball 17 and directions settlement switch 18 ** are moved, and it may be hard to carry out operation. The reason is because the ball 17 and the directions settlement switch 18 adjoin on the trackball 16.

[0007]In the host system with which a miniaturization is demanded, a place required for installation may be unable to secure the second problem easily. The reason is because the area of the trackball 16 which appears in the host system surface becomes large, when the ball 17 and the directions settlement switch 18 adjoin on the trackball 16.

[0008]Therefore, the purpose of this invention raises operativity from becoming final and conclusive directions, without moving cursor with one finger and lifting the finger, and there is in providing the computer input unit which lessens a miniaturization and operation space of a device.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem]A computer input unit of this invention unifies a switch for becoming final and conclusive a ball and directions to which cursor is moved, and after it moves cursor and moves to a position of hope, it is characterized by a trackball which carries out directions decision with the same finger, without lifting a finger.

[0010]Other computer input units of this invention unify a switch for becoming final and conclusive a touchpad and directions to which cursor is moved, and after they move cursor and move to a position of hope, they are characterized by a touchpad which carries out directions decision with the same finger, without lifting a finger.

[0011]

[Embodiment of the Invention]Hereafter, it explains, referring to drawings for the embodiment of the invention of this invention.

[0012]First, a first embodiment of this invention is described with reference to drawing 1 and drawing 2. Drawing 1 shows the perspective view of this invention, and, similarly drawing 2 shows an important section sectional view.

[0013]The computer input unit 1 of this embodiment is projected in part from the case 2 of the shape which is easier to grasp by one hand as an example of a coat than drawing 1, and the case 2, The interface cable or the antenna 5 for signal transmission as an example of a means which transmits decision of the ball 3 attached enabling free rotation, the switch 4, and directions, the X-axis of a ball, and the rotation of Y shaft orientations to a host system, From drawing 2, the encoder 6 and the ball 3 which detect the hand of cut and rotation of the ball 3 enter into the inside of the case 2 to inside to the case 2, It constitutes from the saucer 7 as an example of the returning structure, and the directions settlement switch 8 as an example of a means which becomes final and conclusive the directions to a host system when the ball 3 goes into inside to the case 2.

[0014]Next, operation of this computer input unit 1 is explained. The rotation and hand of cut of the ball 3 are detected by the encoder 6. The encoder 6 changes into a pulse signal the rotation and hand of cut which were detected using a photosensor, a magnetic sensor, etc. A pulse signal is transmitted to a host system via an interface cable or the antenna 5 for signal transmission. The directions settlement switch 8 is in the lower part of the saucer 7, the ball 3 is pushed, if it enters into the case 2, the saucer 7 will move with the ball 3 and the directions settlement switch 8 will be pushed. In order that the encoder 6 may move with the ball 3 and the saucer 7, even if the ball 3 is pushed, the encoder 6 does not malfunction. Directions are become final and conclusive by transmitting the information on the directions decision to a host system via an interface cable or the antenna 5 for signal transmission. Then, if the ball 3 is released, the saucer 7 will return to the original position with the ball 3, and the directions settlement switch 8 will be canceled. The switch 4 is used for the purpose of inputting information into a host system in addition to movement of cursor, and directions decision. Therefore, the switch 4 may not be formed or may be formed. [two or more] The inside of a host system may be equipped also besides putting into the case 2 and

considering it as an independent input device.

[0015]Next, the operation method of this input device 1 is explained. The computer input unit 1 is grasped by hand, and the thumb is put on the ball 3. The ball 3 is rotated and it moves to the part which wants to point to the cursor on the screen of a host system. If movement is completed, the ball 3 will be pushed from a top with the thumb. Directions are become final and conclusive now. The switch 4 is operated by an index finger etc. When the inside of a host system is equipped, except the thumb may be sufficient as the finger which operates the ball 3.

[0016]According to this embodiment, cursor operation and directions decision can be performed only with one finger.

[0017]Next, a second embodiment of this invention is described with reference to drawing 3 and drawing 4. Drawing 3 shows the plan of this invention and, similarly drawing 4 shows a sectional view.

[0018]According to the embodiment of the invention, from drawing 3 the computer input unit 9, As an example of a means which detects the case 10 as an example of a coat, the X-axis of the finger put on the top, and the movement magnitude of Y shaft orientations. The interface cable or the antenna 13 for signal transmission as an example of a means which transmits the X-axis of the ** touchpad 11, the switch 12, directions decision, and a finger and the movement magnitude of Y shaft orientations to a host system is formed. The inside of the case 10 from drawing 4 under the touchpad 11 and its touchpad 11, A means to detect the X-axis of a finger and the movement magnitude of Y shaft orientations consists of the saucer 14 as an example of the structure which enters and returns to inside to a coat, and the directions settlement switch 15 as an example of a means which becomes final and conclusive directions to a computer under the saucer.

[0019]Next, operation of this input device 9 is explained. As one example of the touchpad 11, if a sheet shaped capacitor is touched, it will use as a sensor which detects the touched position using the electric capacity of the portion changing. The electric capacity of the portion traced when the surface of the touchpad 11 was traced with the finger changes, and the degree detects the movement magnitude and the direction of a finger. There are some which detect the movement magnitude and the direction of a finger from change of the pressure which used change and the touch screen of the resistance using a resistance film as other examples of the touchpad 11. The movement magnitude and the direction which were detected are changed into a pulse signal. This pulse signal is transmitted to a host system via an interface cable or the antenna 13 for signal transmission as information for moving the cursor on a screen. If the directions settlement switch 15 is in the lower part of the saucer 14, the touchpad 11 is pushed and it enters into the case 10, the saucer 14 will move with the touchpad 11 and the directions settlement switch 15 will be pushed. Directions are become final and conclusive by transmitting the information to a host system via an interface cable or the antenna 13 for signal transmission. Then, if the touchpad 11 is released, the saucer 14 will return to the original position with the touchpad 11, and the directions settlement switch 15 will be canceled. The switch 12 is used for the purpose of inputting information into a host system in addition to movement of cursor, and directions decision. Therefore, the switch 12 may not be formed or may be formed. [two or more] The inside of a host system may be equipped also besides putting into the case 10 and considering it as an independent input device.

[0020]Next, the index finger explaining the operation method of this input device 9 is put on the touchpad 11. An index finger is moved on the touchpad 11 and it moves to the part which wants to point to the cursor on the screen of a host system. If movement is completed, the touchpad 11 will be pushed from a top in an index finger. Directions are become final and conclusive now. The switch 12 is operated with the thumb. When the inside of a host system is equipped, except an index finger may be sufficient as the finger which operates the touchpad 11.

[0021]According to this embodiment, cursor operation and directions decision can be performed only with one finger.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a perspective view of a first embodiment of an invention.

[Drawing 2]It is an important section sectional view of a first embodiment of an invention.

[Drawing 3]It is a plan of a second embodiment of an invention.

[Drawing 4]It is a sectional view of a second embodiment of an invention.

[Drawing 5]It is a perspective view of the trackball shown in JP,3-266018,A.

[Drawing 6]It is a sectional view of the trackball shown in JP,3-266018,A.

[Description of Notations]

1 A computer input unit of a first embodiment of an invention

2 Case

3 Ball

4 Switch

5 An interface cable or the antenna for signal transmission

6 Encoder

7 Saucer

8 Directions settlement switch

9 A computer input unit of a second embodiment of an invention

10 Case

11 Touchpad

12 Switch

13 An interface cable or the antenna for signal transmission

14 Saucer

15 Directions settlement switch

16 Trackball

17 Ball

18 Directions settlement switch

19 Encoder

[Translation done.]

*** NOTICES ***

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1]A ball attached in part from a coat and a coat enabling free projection rotation, and an encoder which detects the X-axis of a ball, and a rotation of Y shaft orientations, A computer input unit which comprises structure where a ball enters and returns to inside to a coat, a means to become final and conclusive directions to a host system when a ball goes into inside to a coat, and a means to transmit the X-axis of said directions decision and a ball, and a rotation of Y shaft orientations to a host system.

[Claim 2]A means by which the X-axis of a finger and movement magnitude of Y shaft orientations which were attached to a coat and a position which is in sight from the coat outside, and were placed on it are detectable, Structure where said detection means enters and returns to inside to a coat, and when said detection means goes into inside to a coat, A computer input unit which comprises a means to transmit movement magnitude of an X axial direction of a finger, and Y shaft orientations obtained by means to become final and conclusive directions to a host system, and said directions decision and said detection means to a host system.

[Claim 3]A computer input unit which consists of claim 1 becoming final and conclusive a command by choosing a command with cursor displayed on a screen of a host system by rotating a ball with a finger and rotating a ball, and stuffing a ball into inside with the same finger.

[Claim 4]A computer input unit which consists of claim 2 becoming final and conclusive a command by choosing a command with cursor displayed on a screen of a host system by moving a finger on a touchpad and moving a finger, and stuffing a touchpad into inside with the same finger.

[Translation done.]

* NOTICES *

JP0 and INPIT are not responsible for any damages caused by the use of this translation.

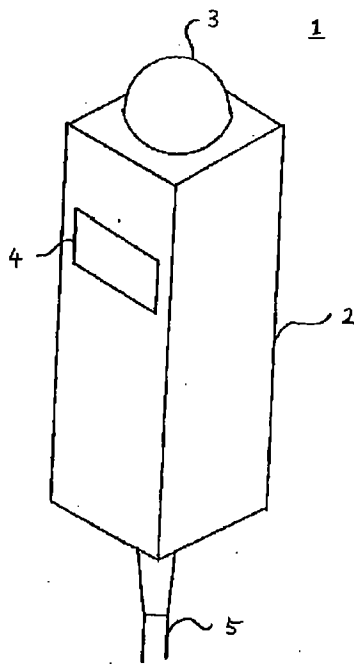
1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

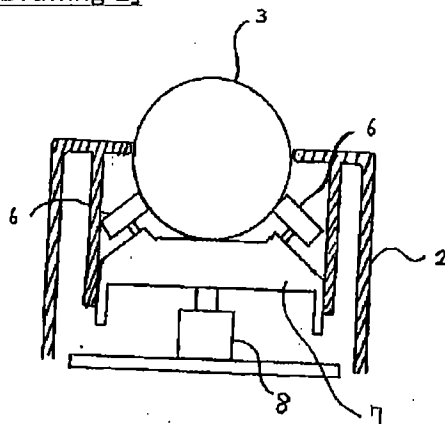
3.In the drawings, any words are not translated.

DRAWINGS

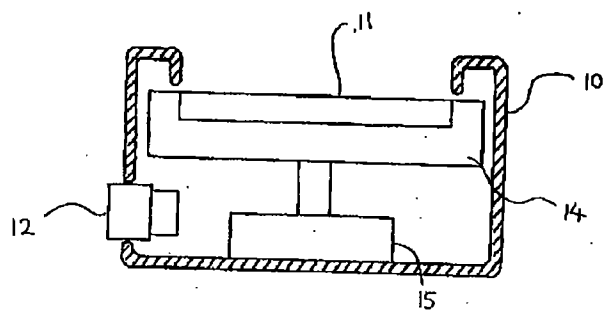
[Drawing 1]



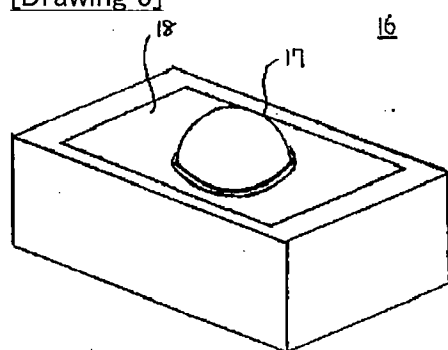
[Drawing 2]



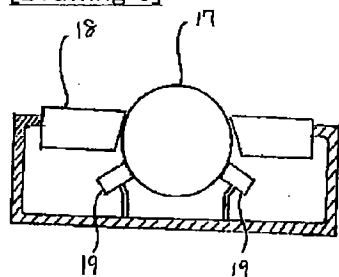
[Drawing 4]



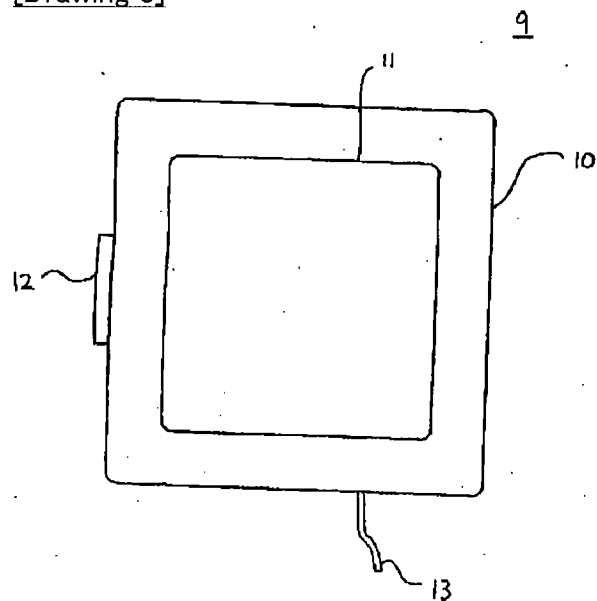
[Drawing 5]



[Drawing 6]



[Drawing 3]



[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平10-74127

(43) 公開日 平成10年(1998) 3月17日

(51) Int.Cl. ⁶	識別記号	庁内整理番号	F I	技術表示箇所
G 0 6 F 3/033	3 4 0		G 0 6 F 3/033	3 4 0 A
	3 8 0			3 8 0 D

審査請求 未請求 請求項の数 4 O L (全 5 頁)

(21) 出願番号 特願平8-229143

(22) 出願日 平成 8 年(1996) 8 月30日

(71) 出願人 000001937

日本電気ホームエレクトロニクス株式会社
大阪府大阪市中央区城見一丁目 4 番24号

(72) 発明者 釘宮 孝

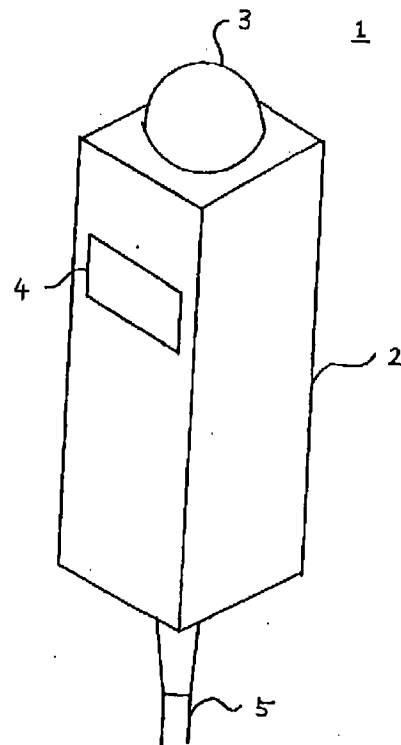
大阪府大阪市中央区城見一丁目 4 番24号
日本電気ホームエレクトロニクス株式会社
内

(54) 【発明の名称】 コンピュータ入力装置

(57) 【要約】

【課題】一つの指でカーソル操作とホストシステムに対する指示の確定をし、操作性を向上させると共に、装置の小型化や操作スペースを少なくするコンピュータ入力装置を提供することにある。

【解決手段】カーソルを移動させるボール3と指示を確定するためのスイッチを一体化し、カーソルを移動させて希望の位置に移動した後、指を離す事無く同じ指で指示を確定することを特徴とする。



【特許請求の範囲】

【請求項 1】 外殻と、外殻から一部突出し回転自在に取り付けられたボールと、ボールの X 軸及び Y 軸方向の回転量を検出するエンコーダと、ボールが外殻に対し中へ入り込み、復帰する構造と、ボールが外殻に対し中に入るによりホストシステムに対する指示を確定する手段と、前記指示確定とボールの X 軸及び Y 軸方向の回転量をホストシステムに伝達する手段から構成されるコンピュータ入力装置。

【請求項 2】 外殻と、外殻外側から見える位置に取り付けられ、その上に置かれた指の X 軸及び Y 軸方向の移動量を検出できる手段と、前記検出手段が外殻に対し中へ入り込み、復帰する構造と、前記検出手段が外殻に対し中に入るにより、ホストシステムに対する指示を確定する手段と、前記指示確定と前記検出手段により得られた指の X 軸方向及び Y 軸方向の移動量をホストシステムに伝達する手段から構成されるコンピュータ入力装置。

【請求項 3】 指でボールを回転させ、ボールを回転させることによりホストシステムの画面に表示されたカーソルで命令を選び、ボールを同じ指で中に押し込むことにより命令を確定することを特徴とする請求項 1 からなるコンピュータ入力装置。

【請求項 4】 タッチパッド上で指を移動させ、指を移動させることによりホストシステムの画面に表示されたカーソルで命令を選び、タッチパッドを同じ指で中に押し込むことにより命令を確定することを特徴とする請求項 2 からなるコンピュータ入力装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明はコンピュータ入力装置に関し、特にポインティングデバイスに関する。

【0002】

【従来の技術】従来、この種のコンピュータ入力装置はマウスが用いられるが、マウスを操作するには狭い場所での用途や、ホストシステムに内蔵する用途においてはマウスのように操作するのに必要な平面の場所を必要としない利点があるトラックボールや、指などの絶対位置を検出し、X 軸方向及び Y 軸方向の移動量を出力できるタッチパッドが用いられている。

【0003】たとえば、特開平 3-266018 号公報には、片手でボール及びスイッチの操作ができるトラックボールの技術が記載されている。図 5 は特開平 3-266018 号公報に示される従来のコンピュータ入力装置の斜視図である。図 6 は図 5 に示される従来のコンピュータ入力装置の断面図である。図 5 よりトラックボール 16 は、あらゆる方向に回転できるように設置されたボール 17、ホストシステムに対する指示を確定するための指示確定スイッチ 18 と、トラックボール 16 の中に図 6 よりボール 17 の回転量と回転方向を検出するエ

ンコーダ 19 とで構成されている。トラックボール 16 の上部に突出しているボール 17 を指で回転させると、エンコーダ 19 が回転量と回転方向を検出してパルス信号に変換し、ホストシステムに画面上のカーソルを移動させるための情報として伝達される。指示確定スイッチ 18 は、画面上のカーソルによって指示された箇所の情報をホストシステムに入力するのに利用する。

【0004】従来のトラックボールの操作には両手が必要だったが、この指示確定スイッチ 18 がトラックボール 16 の表面上でボール 17 に隣接していることにより、人差し指でボール 17 を動かすことによって、ホストシステムの画面上のカーソルを目的の位置まで移動させ、親指で指示確定スイッチ 18 を押すことによって、指示の確定ができるようになった。すなわちボール 17 の操作と指示確定スイッチ 18 の操作が片手で可能となり、マウスと同等の操作が可能となった。

【0005】

【発明が解決しようとする課題】しかしながら、この従来のコンピュータ入力装置では次のような新たな問題点を生じてしまう。

【0006】第一の問題点は、素早い入力及要求される場合にはある指でボール 17 を動かし、別の指で指示確定スイッチ 18 を押すことが必要となる。また同じ指で操作し、指示を確定する場合に、いったん指を離し他方へ置き直すので、隣接するボール 17 や指示確定スイッチ 18 をを動かしてしまい、操作がしにくいことがある。その理由は、ボール 17 と指示確定スイッチ 18 がトラックボール 16 上で隣接しているためである。

【0007】第二の問題点は、小型化が要求されるホストシステムにおいて設置に必要な場所が確保しにくい場合がある。その理由は、ボール 17 と指示確定スイッチ 18 がトラックボール 16 上で隣接していることにより、ホストシステム表面に現れるトラックボール 16 の面積が大きくなるためである。

【0008】従って本発明の目的は、一本の指でカーソルを動かし、その指を離すことなく指示を確定することにより操作性を向上させると共に、装置の小型化や操作スペースを少なくするコンピュータ入力装置を提供することにある。

【0009】

【課題を解決する手段】本発明のコンピュータ入力装置は、カーソルを移動させるボールと指示を確定するためのスイッチを一体化し、カーソルを移動させて希望の位置に移動した後、指を離すことなく同じ指で指示確定するトラックボールを特徴とする。

【0010】本発明の他のコンピュータ入力装置は、カーソルを移動させるタッチパッドと指示を確定するためのスイッチを一体化し、カーソルを移動させて希望の位置に移動した後、指を離すことなく同じ指で指示確定するタッチパッドを特徴とする。

【0011】

【発明の実施の形態】以下、本発明の発明の実施の形態について図面を参照しながら説明する。

【0012】まず、図1および図2を参照して本発明の第一の実施の形態について説明する。図1は本発明の斜視図を示し、図2は同じく要部断面図を示す。

【0013】本実施の形態のコンピュータ入力装置1は、図1より外殻の一例としての片手で握りやすい形状のケース2、ケース2から一部突出し、回転自在に取り付けられたボール3、スイッチ4、指示の確定とボールのX軸及びY軸方向の回転量をホストシステムに伝達する手段の一例としてのインタフェースケーブルまたは信号送信用アンテナ5と、ケース2の内部に図2より、ボール3の回転方向と回転量を検出するエンコーダ6、ボール3がケース2に対し中へ入り込み、復帰する構造の一例としての受け皿7、ボール3がケース2に対し中に入るによりホストシステムに対する指示を確定する手段の一例としての指示確定スイッチ8で構成する。

【0014】次にこのコンピュータ入力装置1の動作について説明する。ボール3の回転量と回転方向は、エンコーダ6により検出される。エンコーダ6は検出した回転量と回転方向を、光センサや磁気センサなどを用いてパルス信号に変換する。パルス信号はインタフェースケーブルまたは信号送信用アンテナ5を経由してホストシステムに伝達される。指示確定スイッチ8は受け皿7の下部にあり、ボール3が押され、ケース2の中に入り込むとボール3と共に受け皿7が移動し、指示確定スイッチ8が押される。エンコーダ6はボール3、受け皿7と共に移動するため、ボール3が押されてもエンコーダ6は誤動作しない。その指示確定の情報がインタフェースケーブル又は信号送信用アンテナ5を経由して、ホストシステムに伝達されることにより指示が確定する。その後、ボール3が解放されると受け皿7はボール3と共に元の位置へと復帰し、指示確定スイッチ8は解除される。スイッチ4は、カーソルの移動および指示確定以外にホストシステムに情報を入力する目的に利用する。したがって、スイッチ4は設けなくてもあるいは複数設けても良い。ケース2に入れて単独の入力装置とする以外にも、ホストシステム内部に装備しても良い。

【0015】次にこの入力装置1の操作方法について説明する。手でコンピュータ入力装置1を握り、親指をボール3の上に乗せる。ボール3を回転させ、ホストシステムの画面上のカーソルを指示したい箇所に移動する。移動が完了したら、親指にて上からボール3を押す。これで指示が確定される。スイッチ4は人差し指などで操作する。ホストシステム内部に装備した場合はボール3を操作する指は親指以外でもよい。

【0016】本実施の形態によれば一本の指だけでカーソル操作と指示確定ができる。

【0017】次に、図3および図4を参照して本発明の

第二の実施の形態について説明する。図3は本発明の上面図を示し、図4は同じく断面図を示す。

【0018】本発明の実施の形態によれば、図3よりコンピュータ入力装置9は、外殻の一例としてのケース10、上に置かれた指のX軸及びY軸方向の移動量を検出する手段の一例としてのタッチパッド11、スイッチ12、指示確定と指のX軸およびY軸方向の移動量をホストシステムに伝達する手段の一例としてのインタフェースケーブルまたは信号送信用アンテナ13が設けられている。図4よりケース10の内部は、タッチパッド11とそのタッチパッド11の下に、指のX軸及びY軸方向の移動量を検出する手段が外殻に対し中に入り込み、復帰する構造の一例としての受け皿14、その受け皿の下にコンピュータに指示を確定する手段の一例としての指示確定スイッチ15で構成する。

【0019】次にこの入力装置9の動作について説明する。タッチパッド11の一つの例としては、シート状のコンデンサに触れるとその部分の静電容量が変化することを利用して、触れた位置を検出するセンサとして用いたものである。タッチパッド11の表面を指でなぞるとなぞった部分の静電容量が変化し、その度合により指の移動量と方向を検出する。タッチパッド11の他の例としては、抵抗膜を利用した抵抗値の変化やタッチスクリーンを利用した圧力の変化から指の移動量と方向を検出するものもある。検出された移動量と方向はパルス信号に変換する。このパルス信号が、ホストシステムに画面上のカーソルを移動させるための情報としてインタフェースケーブルまたは信号送信用アンテナ13を経由して伝達される。指示確定スイッチ15は受け皿14の下部にあり、タッチパッド11が押されケース10の中に入り込むと、タッチパッド11と共に受け皿14が移動し、指示確定スイッチ15が押される。その情報がインタフェースケーブルまたは信号送信用アンテナ13を経由して、ホストシステムに伝達されることにより指示が確定する。その後、タッチパッド11が解放されると受け皿14はタッチパッド11と共に元の位置へと復帰し、指示確定スイッチ15は解除される。スイッチ12は、カーソルの移動および指示確定以外にホストシステムに情報を入力する目的に利用する。したがって、スイッチ12は設けなくてもあるいは複数設けても良い。ケース10に入れて単独の入力装置とする以外にも、ホストシステム内部に装備しても良い。

【0020】次にこの入力装置9の操作方法について説明する。人差し指をタッチパッド11の上に乗せる。タッチパッド11の上で人差し指を動かし、ホストシステムの画面上のカーソルを指示したい箇所に移動する。移動が完了したら、人差し指にて上からタッチパッド11を押す。これで指示が確定される。スイッチ12は親指で操作する。ホストシステム内部に装備した場合はタッチパッド11を操作する指は人差し指以外でも良い。

5

6

【0021】本実施の形態によれば一本の指だけでカーソル操作と指示確定ができる。

【0022】

【発明の効果】以上説明したように本発明によれば、ホストシステムの画面に表示されるカーソルを移動させるボールまたは上に置かれた指のX軸及びY軸方向の移動量を検出する手段が押し込まれることにより指示確定スイッチが入る。従って、カーソルを移動させて希望の入力位置に移動した後、同じ指で指示確定ができるようになり、装置の小型化や動作に必要なスペースの減少並びに操作性の向上を図ることができる。

【図面の簡単な説明】

【図1】発明の第一の実施の形態の斜視図である。

【図2】発明の第一の実施の形態の要部断面図である。

【図3】発明の第二の実施の形態の上面図である。

【図4】発明の第二の実施の形態の断面図である。

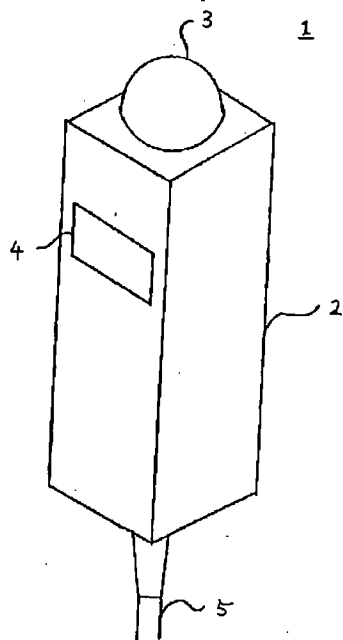
【図5】特開平3-266018号に示されるトラックボールの斜視図である。

【図6】特開平3-266018号に示されるトラックボールの断面図である。

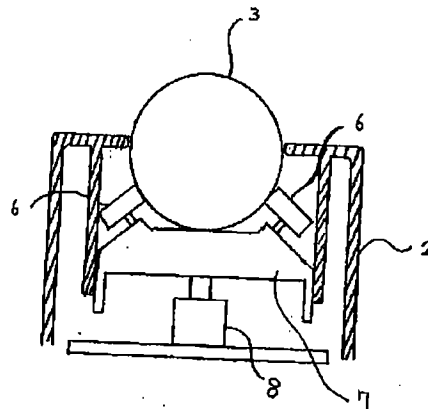
【符号の説明】

- | | |
|-----|-------------------------|
| * 1 | 発明の第一の実施の形態のコンピュータ入力装置 |
| 2 | ケース |
| 3 | ボール |
| 4 | スイッチ |
| 5 | インタフェースケーブルまたは信号送信用アンテナ |
| 6 | エンコーダ |
| 7 | 受け皿 |
| 8 | 指示確定スイッチ |
| 9 | 発明の第二の実施の形態のコンピュータ入力装置 |
| 10 | ケース |
| 11 | タッチパッド |
| 12 | スイッチ |
| 13 | インタフェースケーブルまたは信号送信用アンテナ |
| 14 | 受け皿 |
| 15 | 指示確定スイッチ |
| 16 | トラックボール |
| 17 | ボール |
| 18 | 指示確定スイッチ |
| 19 | エンコーダ |

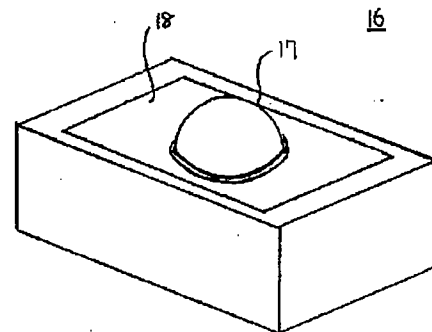
【図1】



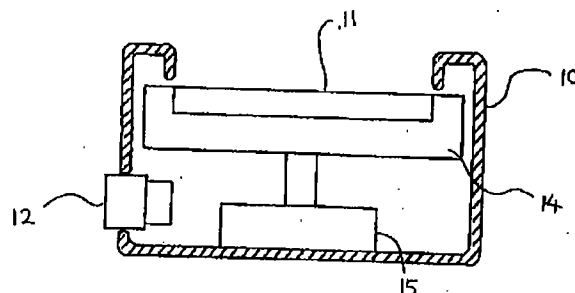
【図2】



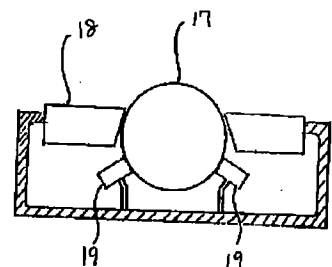
【図5】



【図4】



【図6】



【図3】

